APRIL/MAY 2025

FCA53/FCS53/CCA53/CCS53 — DESIGN AND ANALYSIS OF ALGORITHMS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

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1. What is an Algorithm?
2. Define the term – Stack.
3. What is Merge sort?
4. What is Selection sort?
5. Define the term – Greedy method.
6. Define the term – Minimum-cost spanning tree.
7. What are Binary tree traversal techniques?
8. Define-0/1 Knapsack problem.
9. What is Hamiltonian cycle?
10. What is 8-Queens problem?

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions.

11. (a) Discuss on the basics of Tree and Binary tree.

Or

(b) Explain the concept of Space and Time complexity.

12. (a) Describe the working of Quick sort algorithm using an example.

Or

(b) Discuss on Strassen's Matrix multiplication method.

13. (a) Explain the method of Tree Vertex splitting.

Or

(b) Describe the working of Prim's algorithm using an example.

14. (a) Discuss on algorithm for Multistage Graphs in dynamic programming.

Or

(b) Explain the working of Optimal Binary search trees.

15. (a) Describe the Graph coloring problem.

Or

(b) Discuss on FIFO and LC Branch-and-Bound solutions.

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SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Describe the fundamentals of Graph and its representations.

17. Discuss on the Binary search algorithm with an example.

18. Explain the algorithm to solve the Knapsack problem in Greedy method.

19. Describe about the Graph traversal techniques using examples.

20. Discuss on the algorithm to solve the sum of subsets problem.

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